Fig. 1

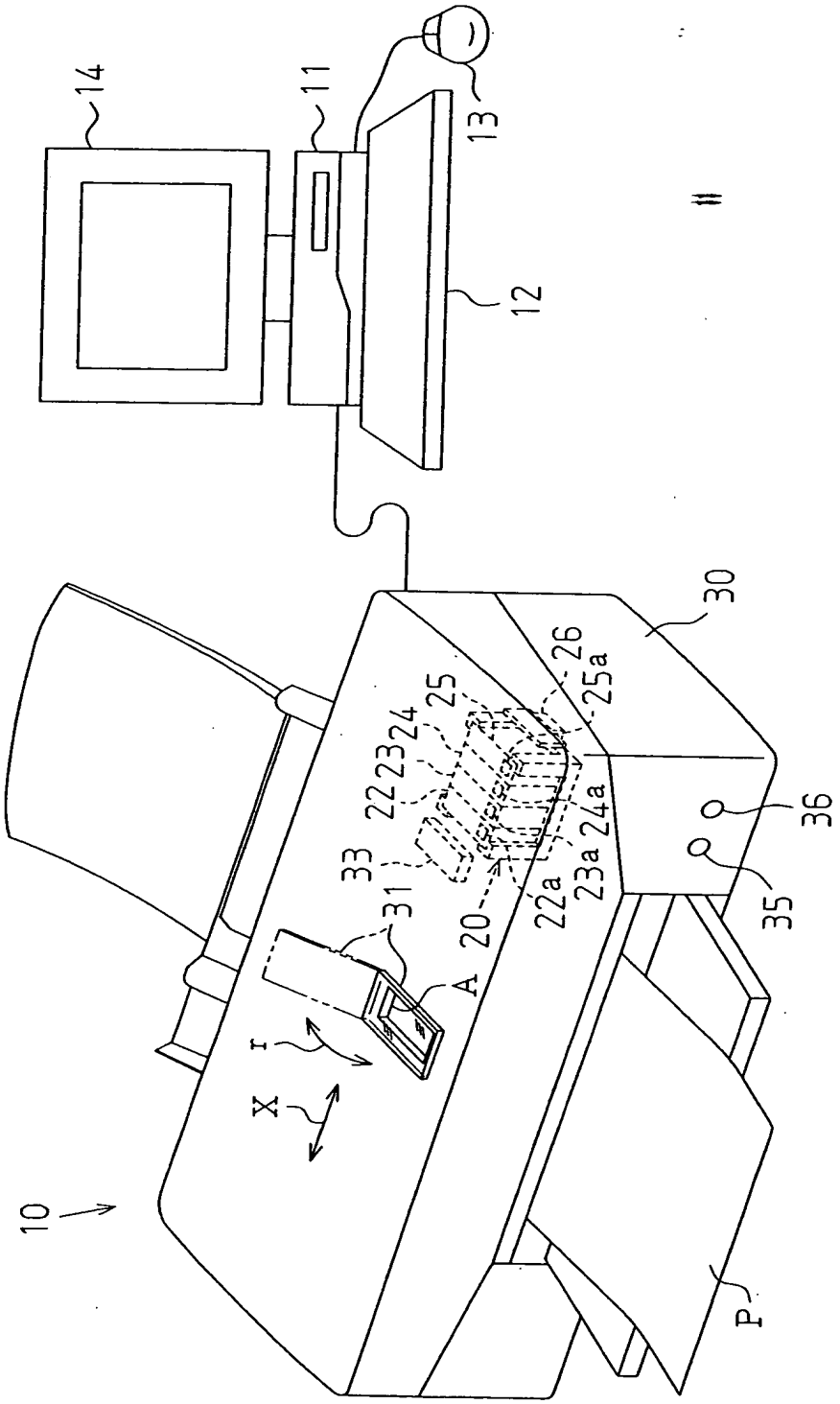


Fig. 2

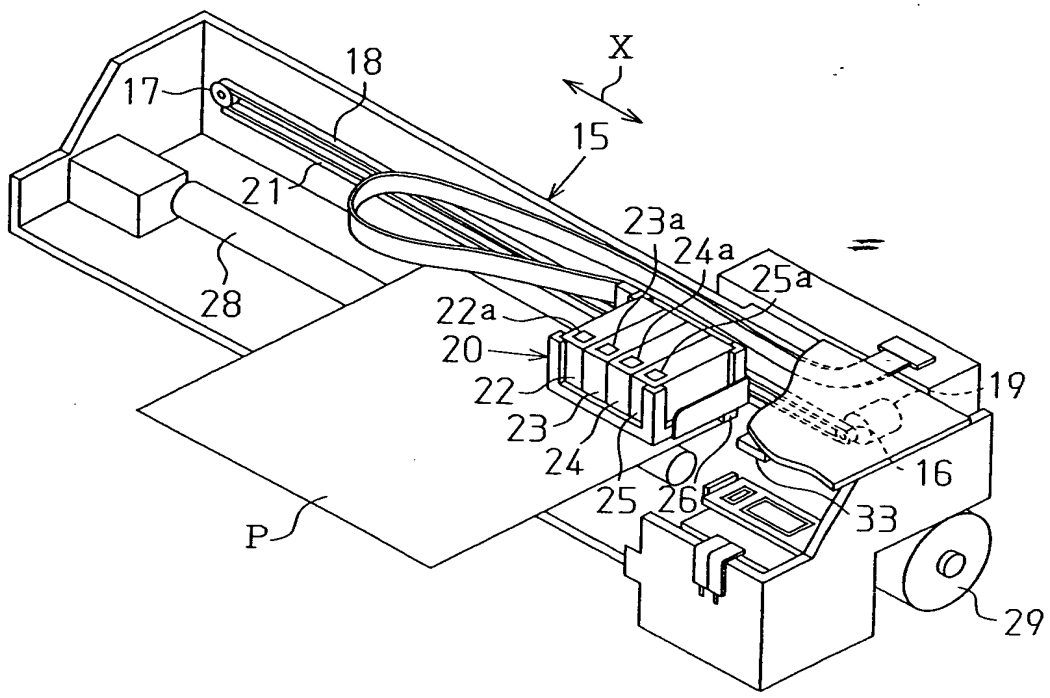

X
18
17
15
21
23a
24a
25a
28
22a
20
22
19
23
24
16
25
26
33
P
29

Fig. 3

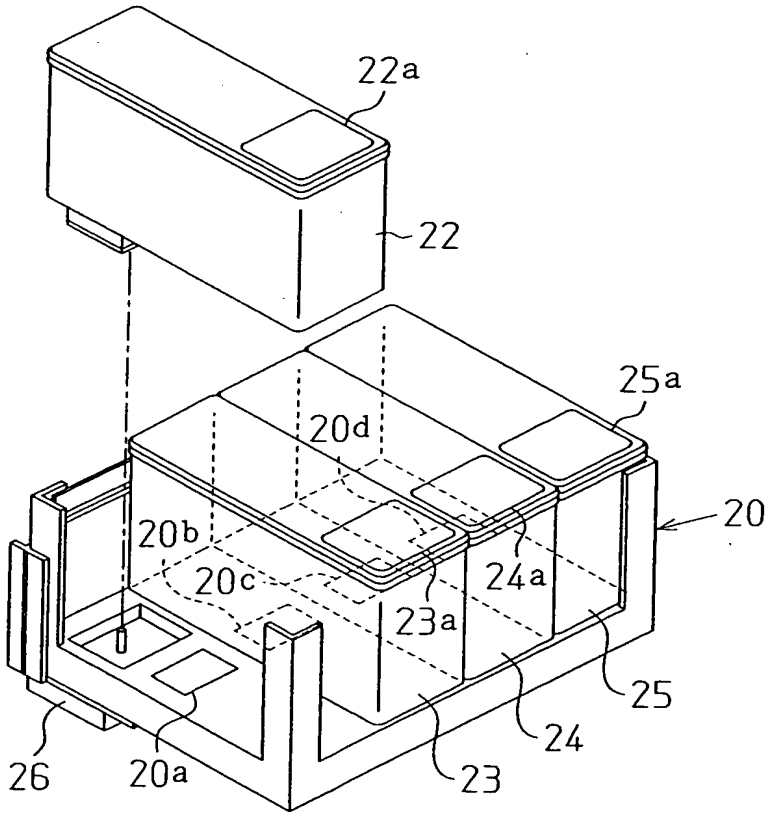

22a
22
25a
20d
20
20b
20c
24a
23a
25
24
26
20a
23

Fig. 4

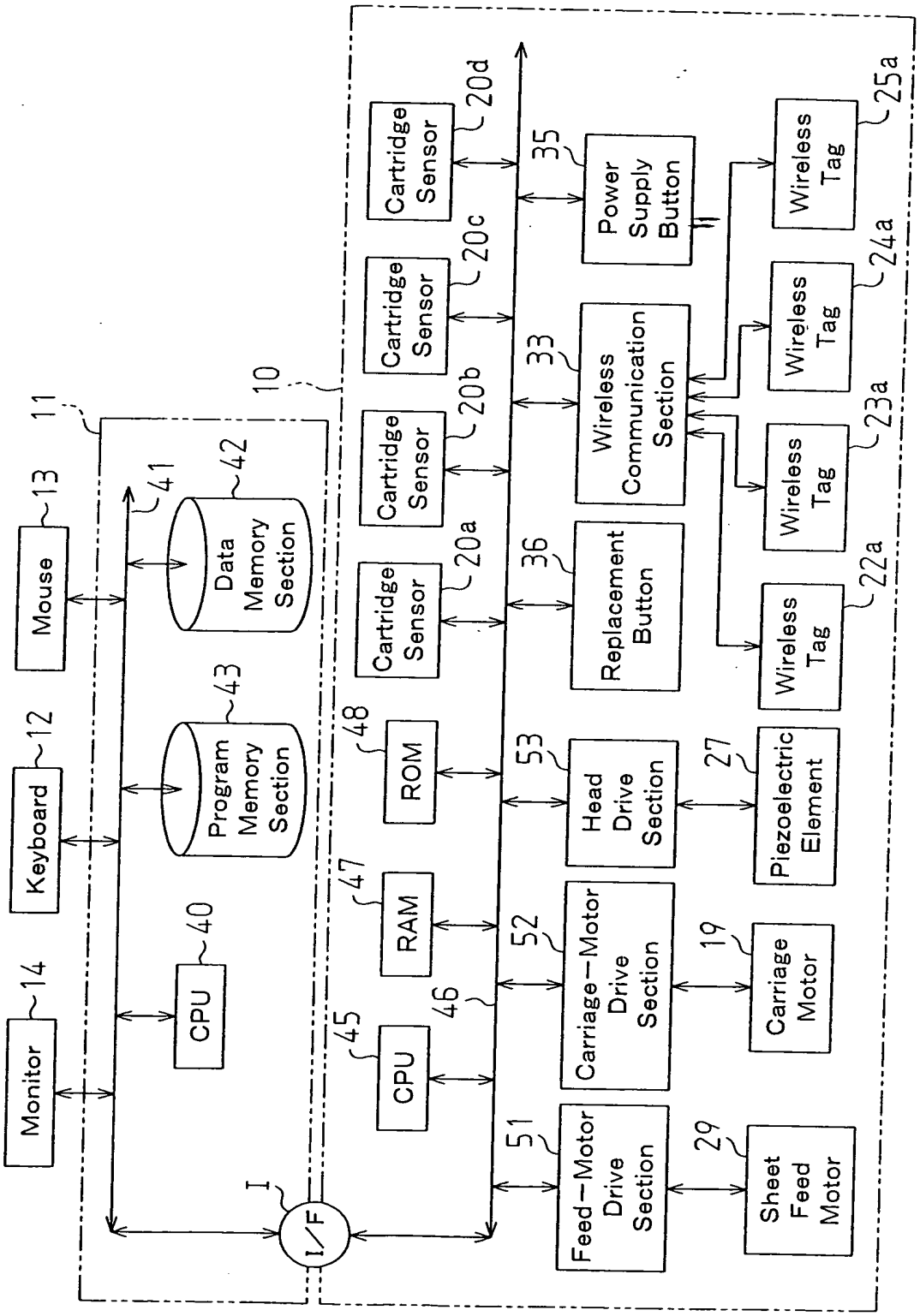

10
11
Monitor
14
Keyboard
12
Mouse
13
CPU
40
Program Memory Section
43
Data Memory Section
42
41
I/F
I
CPU
45
RAM
47
ROM
48
46
Carriage-Motor Drive Section
52
Feed-Motor Drive Section
51
Head Drive Section
53
Piezoelectric Element
27
Carriage Motor
19
Sheet Feed Motor
29
Cartridge Sensor
20a
Cartridge Sensor
20b
Cartridge Sensor
20c
Cartridge Sensor
20d
Replacement Button
36
Wireless Communication Section
33
Power Supply Button
35
Wireless Tag
22a
Wireless Tag
23a
Wireless Tag
24a
Wireless Tag
25a

Fig. 5

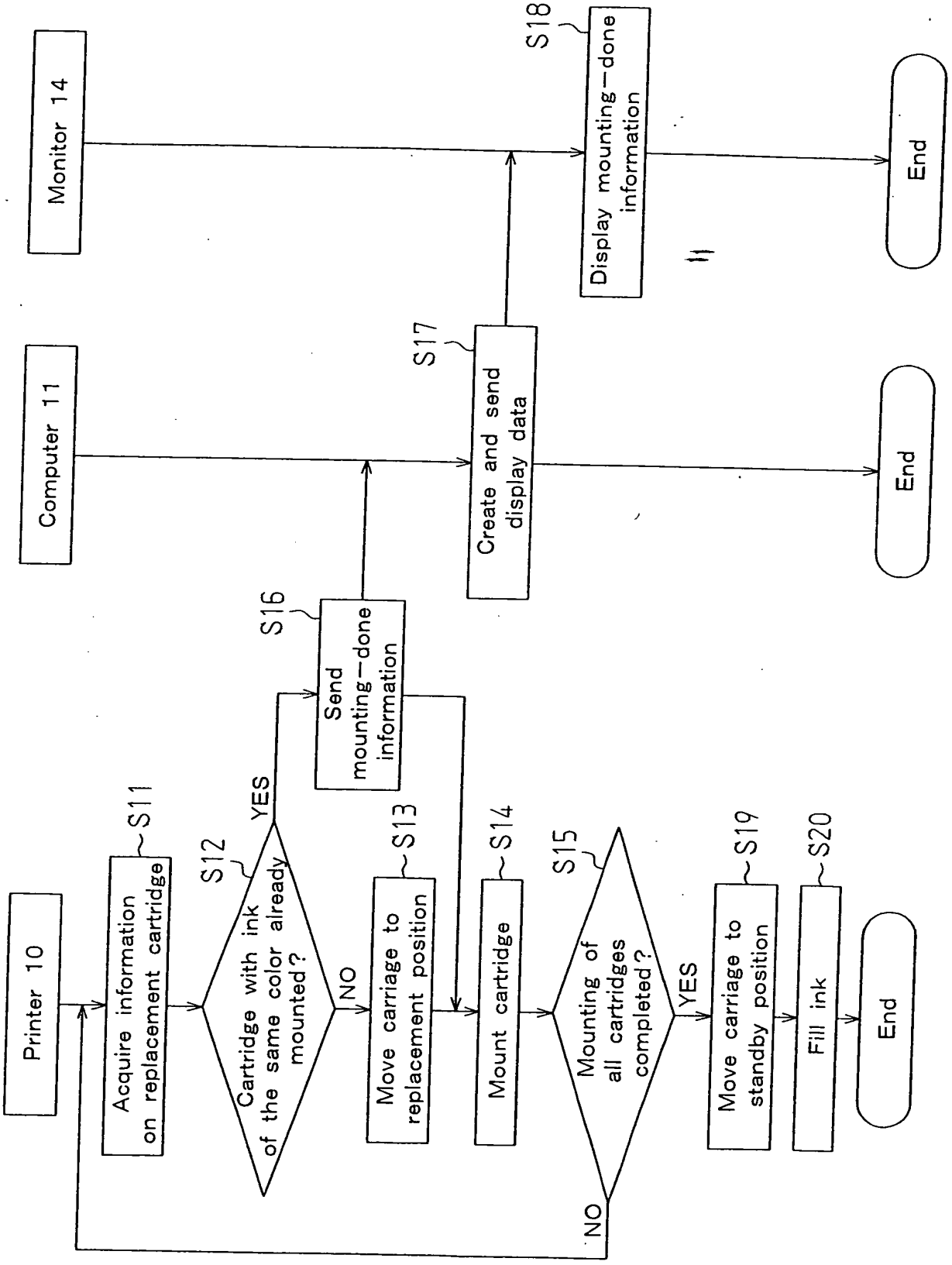

Printer 10
Acquire information on replacement cartridge
S11
Cartridge with ink of the same color already mounted?
S12
YES
NO
Send mounting-done information
S16
Move carriage to replacement position
S13
Mount cartridge
S14
Mounting of all cartridges completed?
S15
YES
NO
Move carriage to standby position
S19
Fill ink
S20
End
Computer 11
Create and send display data
S17
End
Monitor 14
Display mounting-done information
S18
End

Fig. 6

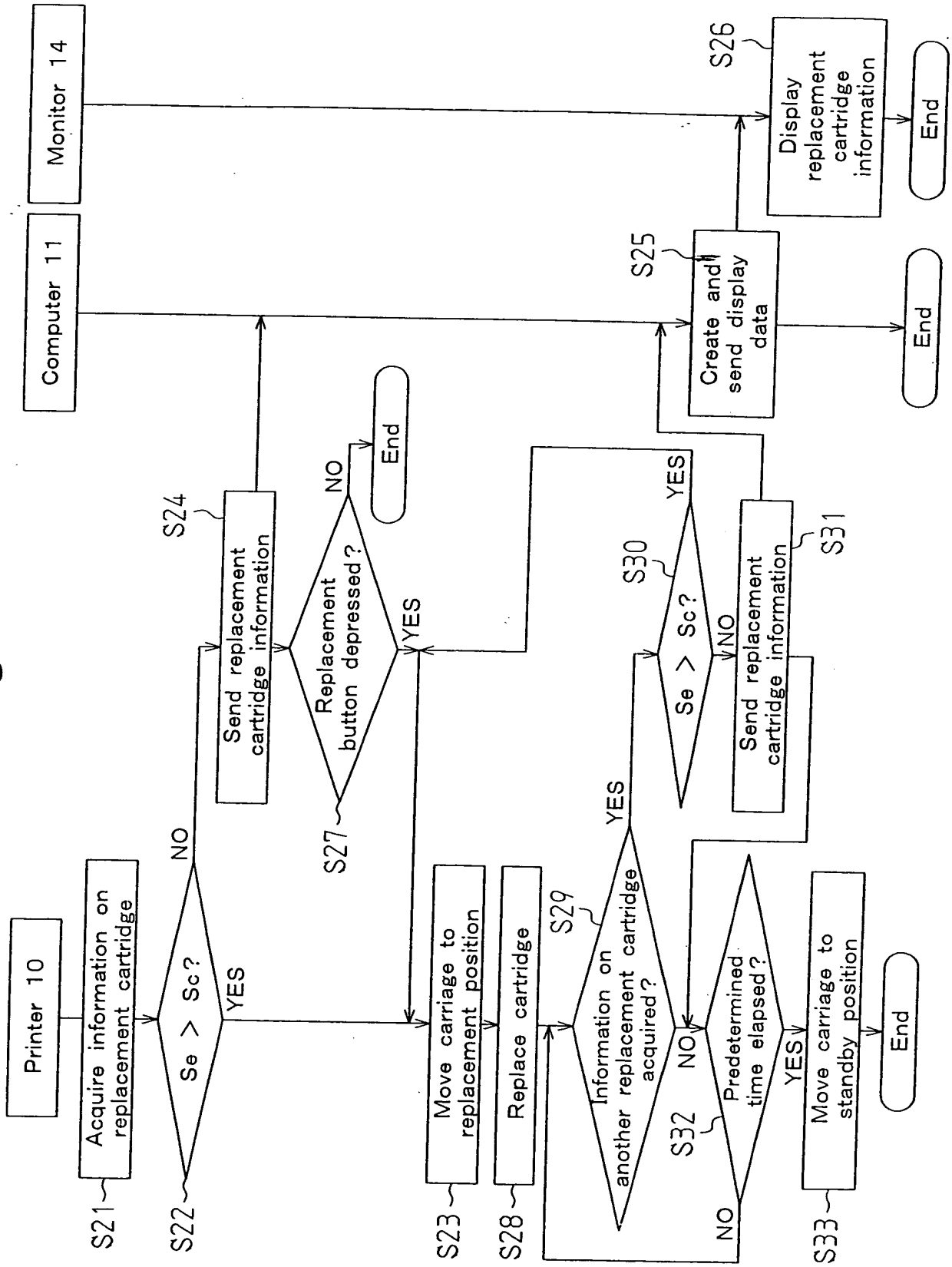

Printer 10
Computer 11
Monitor 14
Acquire information on replacement cartridge
S21
Se > Sc?
S22
NO
YES
Send replacement cartridge information
S24
Replacement button depressed?
S27
NO
YES
End
Move carriage to replacement position
S23
Replace cartridge
S28
Information on another replacement cartridge acquired?
S29
YES
NO
Predetermined time elapsed?
S32
NO
YES
Move carriage to standby position
S33
End
Se > Sc?
S30
YES
NO
Send replacement cartridge information
S31
Create and send display data
S25
End
Display replacement cartridge information
S26
End

Fig. 7

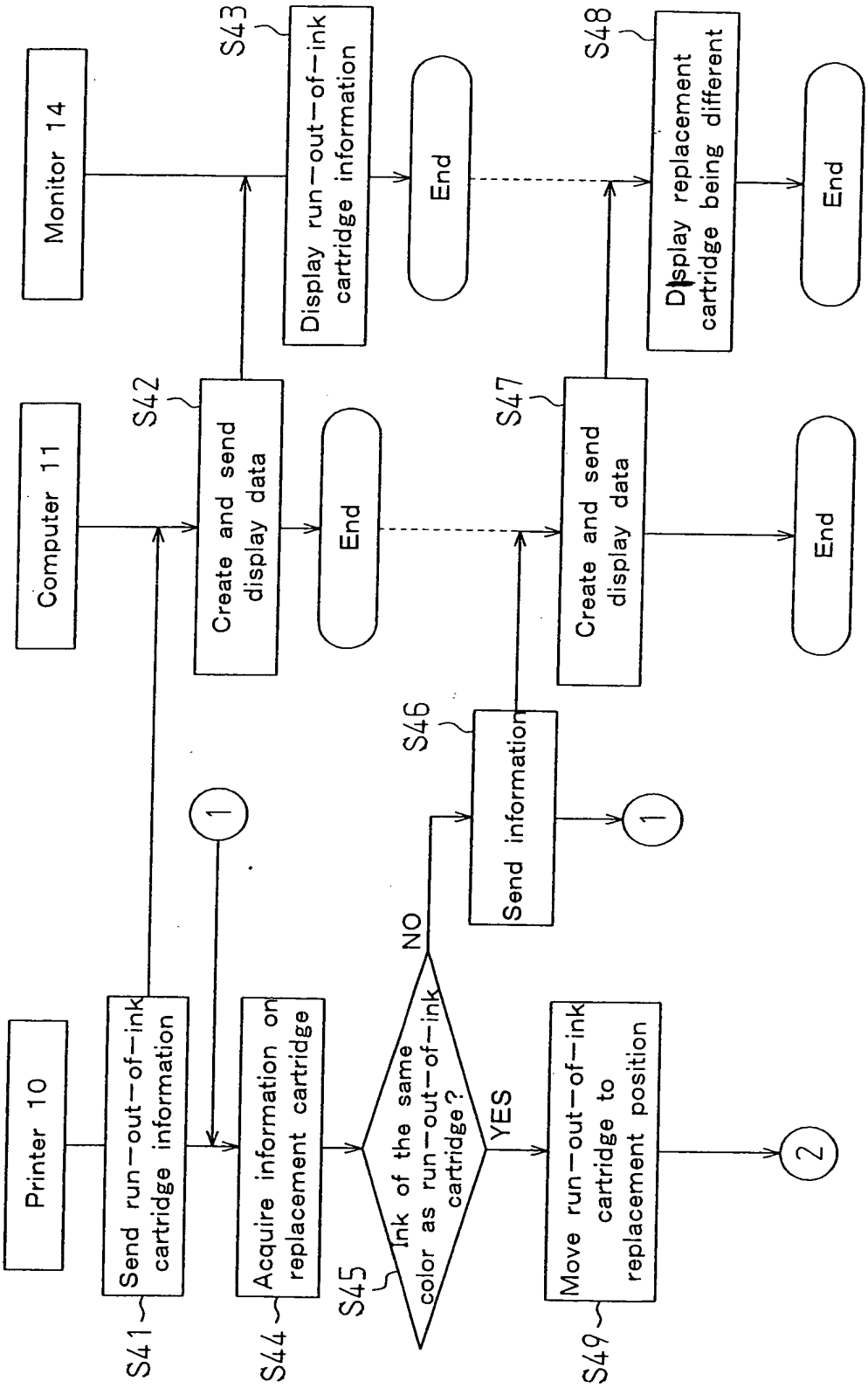

Printer 10
Send run-out-of-ink cartridge information
S41
Acquire information on replacement cartridge
S44
Ink of the same color as run-out-of-ink cartridge?
S45
NO
YES
Send information
S46
Move run-out-of-ink cartridge to replacement position
S49
1
2
Computer 11
Create and send display data
S42
End
Monitor 14
Display run-out-of-ink cartridge information
S43
End
Create and send display data
S47
End
Display replacement cartridge being different
S48
End

Fig. 8

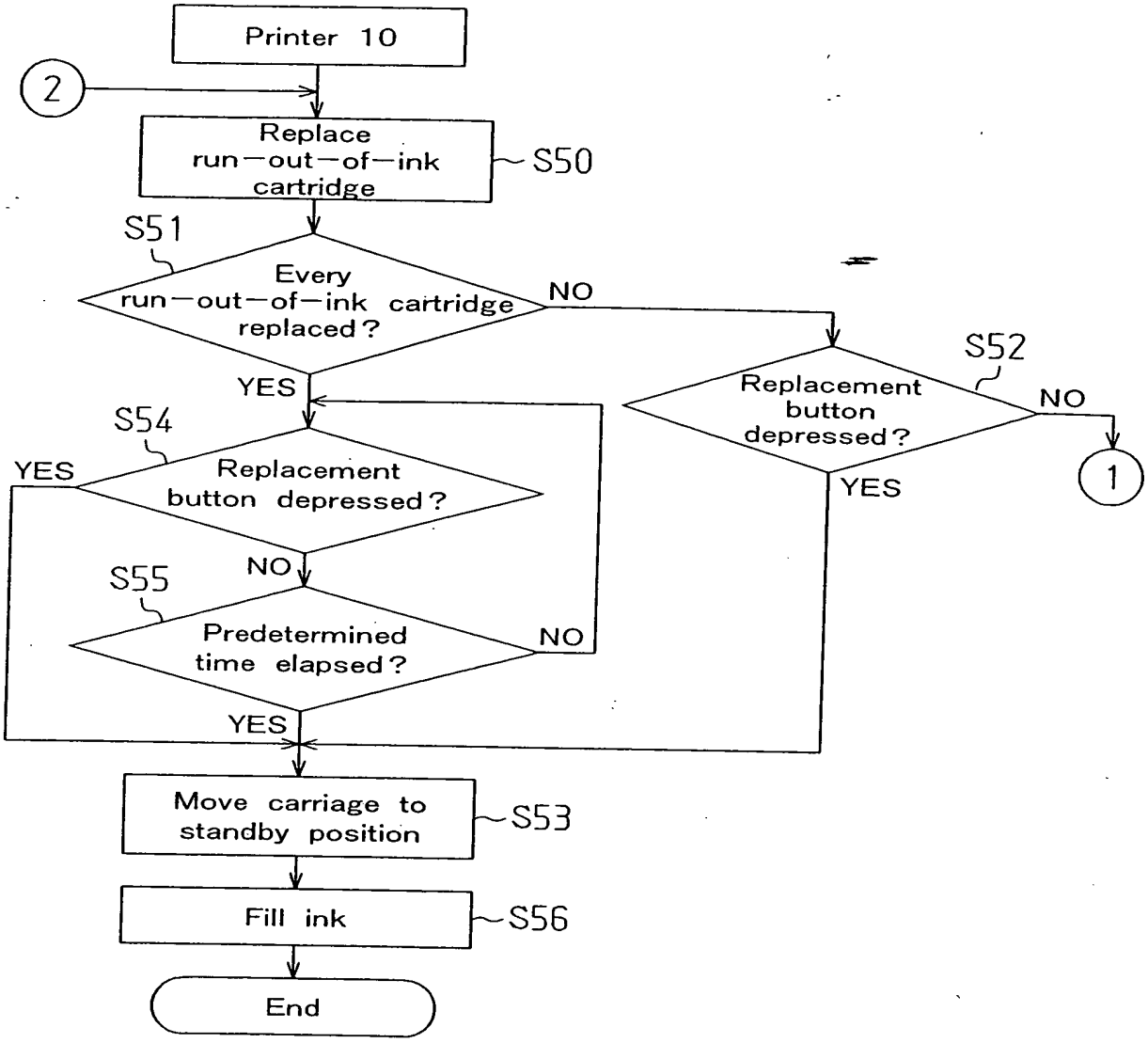

Printer 10
2
Replace run-out-of-ink cartridge
S50
S51
Every run-out-of-ink cartridge replaced?
NO
YES
S52
Replacement button depressed?
NO
YES
1
S54
Replacement button depressed?
YES
NO
S55
Predetermined time elapsed?
NO
YES
Move carriage to standby position
S53
Fill ink
S56
End

Fig. 9

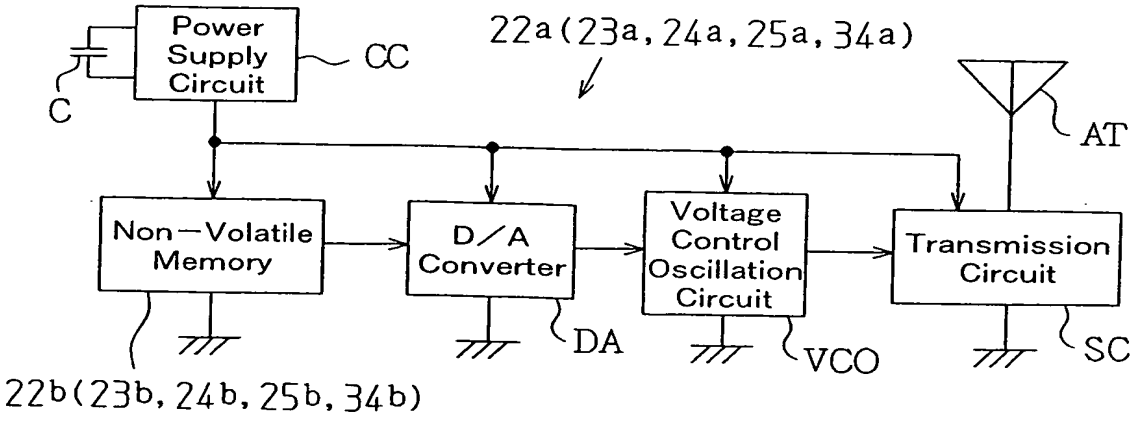

Power Supply Circuit
CC
C
22a(23a, 24a, 25a, 34a)
AT
Non-Volatile Memory
D/A Converter
Voltage Control Oscillation Circuit
Transmission Circuit
DA
VCO
SC
22b(23b, 24b, 25b, 34b)

Fig. 10(a)

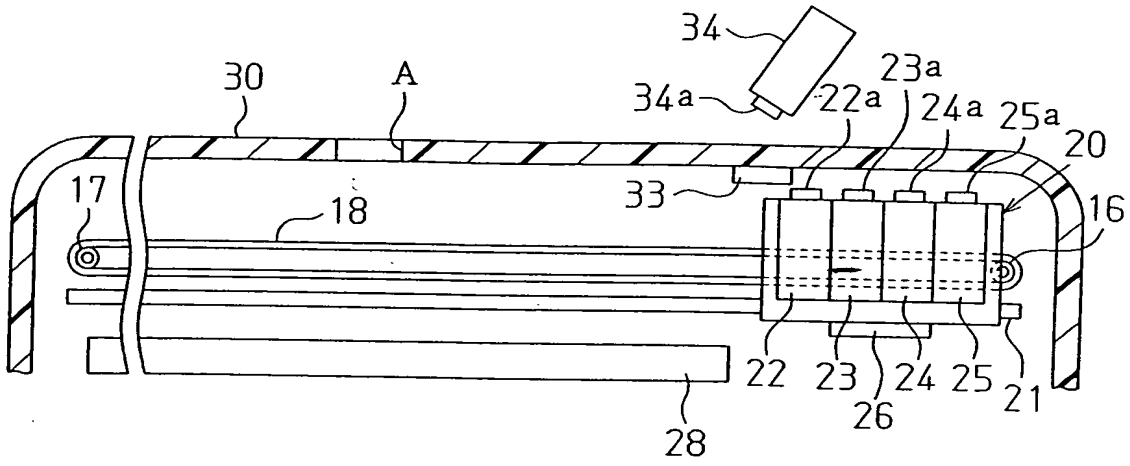


Fig. 10(b)

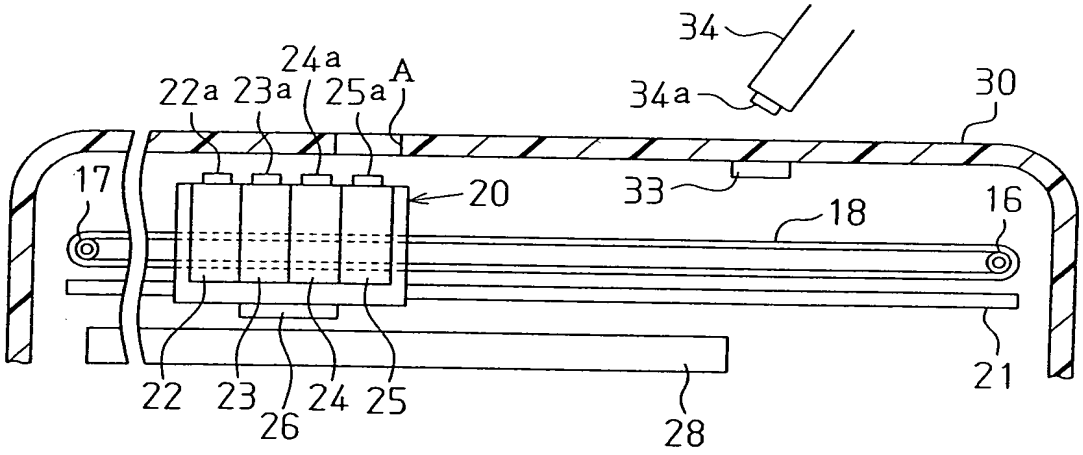


Fig. 10(c)

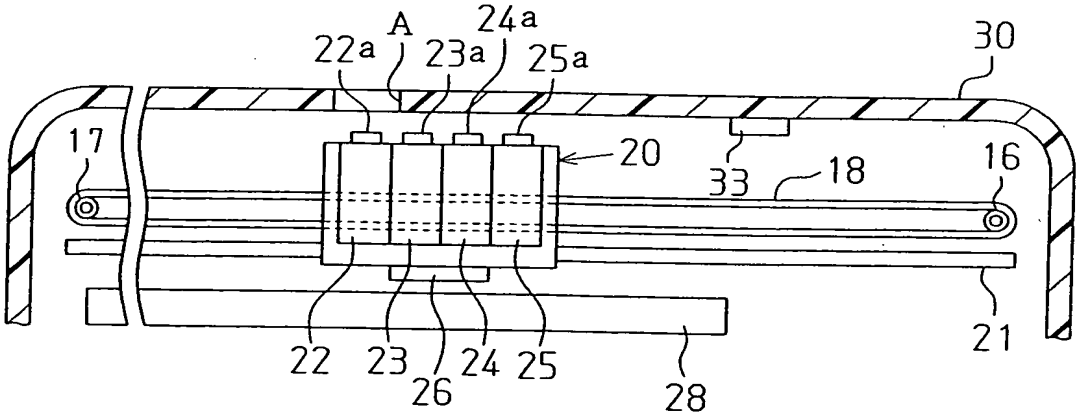


Fig. 11

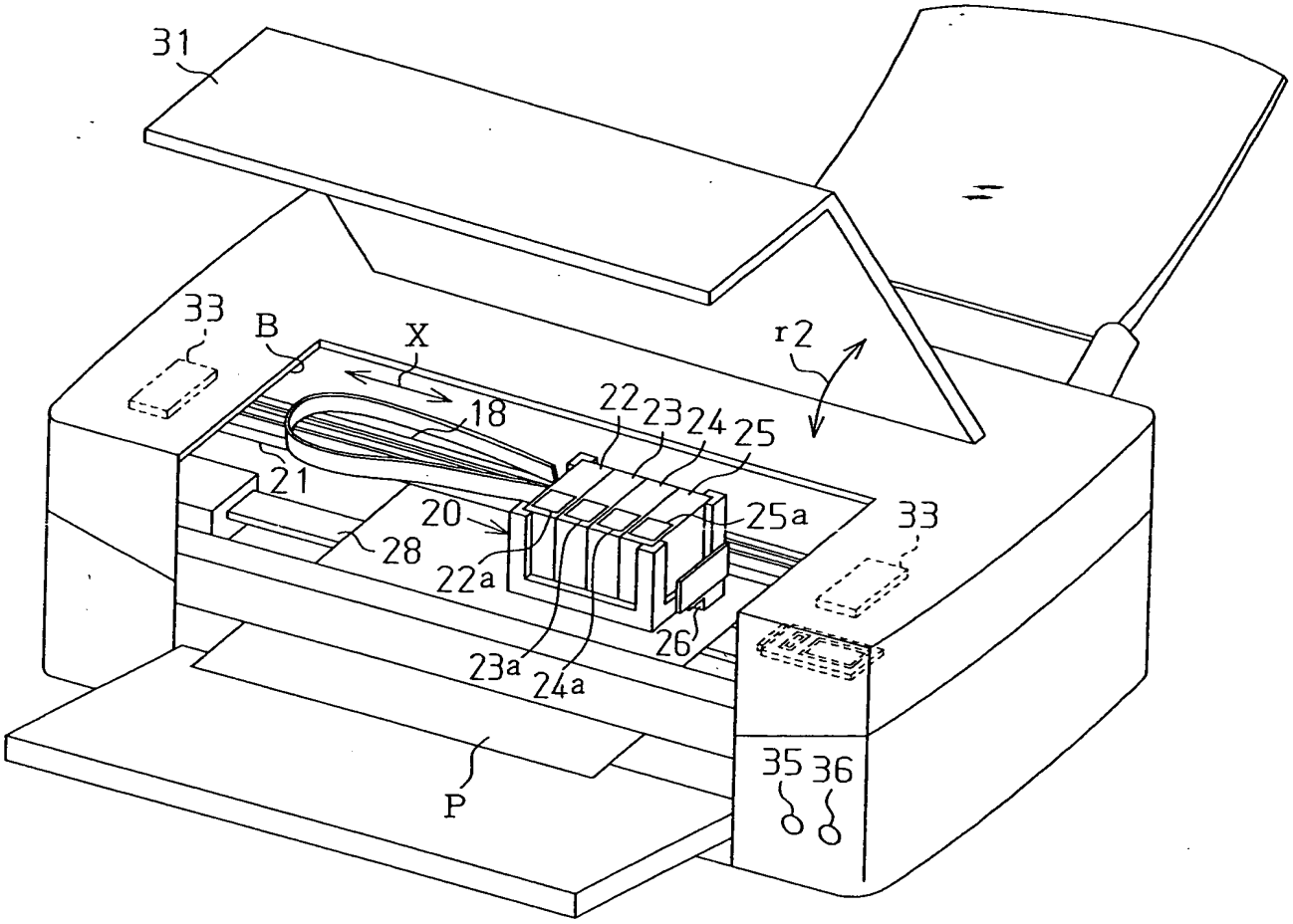
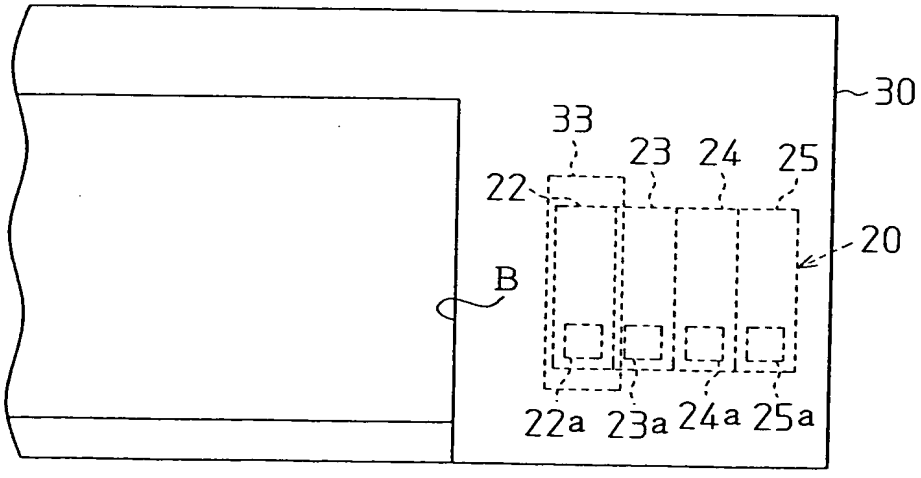

31
33
B
X
r2
18
22
23
24
25
21
20
25a
33
28
22a
26
23a
24a
35
36
P

Fig. 12


30
33
23
24
25
22
20
B
22a
23a
24a
25a